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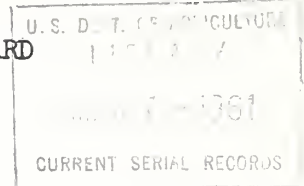
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INEDIBLE TALLOW AND GREASE OUTPUT TO CONTINUE UPWARD

by

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One of the most outstanding features in the U. S. fats and oils economy in recent years has been the spectacular increase in inedible tallow and grease production and exports. In the past decade, output increased from 2.3 billion pounds in 1951-52 to a record 3.5 billion in 1959-60, a rise of over 50 percent, and most of this increase has moved into export (Table 17, page 22). Exports increased from 0.7 billion pounds to 1.7 billion during this same period.

Virtually all of this gain was accounted for by larger dollar exports as only small quantities moved out under P.L. 480. The U. S. now produces about half of the world's tallow and greases and accounts for about two-thirds of the world trade.

For years most of our inedible tallow and grease went into soap, but the marketing pattern for these products has been radically altered in recent years. The rise in the use of detergents combined with increased usage in animal feeds and a wide range of fatty acid products has maintained domestic consumption at approximately the same level. However, the greatly increased tallow production has moved more and more tallow into export channels.

Output of inedible tallow and grease in the 1960-61 marketing year that commenced October 1, 1960, is forecast at 3.6 billion pounds, about 2 percent more than last year's record. Cattle slaughter is expected to continue its uptrend during 1960-61 but hog slaughter probably will drop slightly. Domestic use of inedible tallow and greases is forecast at 1.8 billion pounds or about the same as the past 4 years. Exports are also forecast at 1.8 billion pounds, up about 5 percent from the record 1.7 billion shipped out in 1959-60. This would leave carryover stocks on October 1, 1961 at 350 million pounds or about the same as the beginning of the year.

Sources and Grades of Inedible Animal Fats

The growth in the production of inedible tallow and greases is associated with the secular uptrend in livestock slaughter. The rendering and meat packing industries are the principal producers of these inedible animal fats. In recent years, meatpackers accounted for about 33 percent of the total inedible tallow and greases produced and renderers about 61 percent.

Inedible tallow and greases are byproducts almost entirely from cattle and hogs, with sheep, poultry, and other animals contributing small quantities. Either fat can be derived from either animal, but in practice, most of the tallow comes from beef and most of the greases come from hogs. The distinction between tallow and greases is one of definition: An animal fat is tallow if its titre (hardness) is 40 or higher, it is grease if its titre is below 40.

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Table 17.--Tallow, inedible, and greases: Supply and disposition,
1935-39 average and 1947-60

Year beginning October	Supply				Disposition			
	Apparent		Stocks	Total	Exports	Domestic	Price per pound	
	production	Imports	Oct. 1			disap-	Chicago	
	1/					pearance	Prime	No. 1
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Cents	Cents
1935-39 Av.	888	51	315	1,254	86	949	6.2	5.6
1947	1,980	1	259	2,240	74	1,842	18.5	17.3
1948	2,101	1	325	2,427	373	1,699	8.2	6.9
1949	2,150	2	356	2,508	497	1,733	6.8	5.9
1950	2,343	4	279	2,626	509	1,777	13.5	11.9
1951	2,268	1	340	2,609	720	1,550	6.3	5.1
1952	2,616	1	340	2,957	1,070	1,523	4.3	3.6
1953	2,661	3	363	3,027	1,186	1,574	6.2	5.6
1954	2,875	4	268	3,147	1,265	1,620	7.0	6.5
1955	3,215	2	260	3,477	1,494	1,677	6.9	6.3
1956	3,147	3	306	3,456	1,431	1,786	7.1	6.6
1957	2,900	2/	239	3,139	1,107	1,802	7.6	7.0
1958	3,198	2	230	3,430	1,311	1,793	6.9	6.0
1959 3/	3,523	2/	327	3,850	1,718	1,790	5.6	4.5
1960 4/	3,600	2	343	3,945	1,800	1,800		

1/ Apparent production computed from factory consumption, net foreign trade, and change in stocks. Reported factory consumption excludes that from small rendering plants. 2/ Less than 500,000 pounds. 3/ Preliminary. 4/ Forecast except stocks on October 1. Totals computed from unrounded numbers.

Table 18.--Tallow, inedible, and greases: Utilization,
1935-39 average and 1947-59

Year beginning October	Non food products						
	Soap	Animal feeds	Fatty acids	Lubricants and similar oils	Other	Loss	Total
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
Average							
1935-39	787	---	---	---	161	1	949
1947	1,510	---	184	23	125	---	1,842
1948	1,381	---	173	25	119	2	1,699
1949	1,335	---	202	21	176	---	1,733
1950	1,280	---	250	28	217	1	1,777
1951	1,103	---	199	24	224	---	1,550
1952	1,008	---	237	24	252	1	1,523
1953	967	71	245	25	258	8	1,574
1954	861	174	267	38	268	12	1,620
1955	840	263	290	38	229	17	1,677
1956	788	383	284	34	285	13	1,786
1957	744	542	249	29	235	3	1,802
1958	732	476	352	66	167	---	1,793
1959 1/	727	439	390	79	154	---	1,790
1960							

1/ Preliminary.

Totals computed from unrounded numbers

The characteristics of the commonly recognized grades of inedible tallow and greases are shown in Table 19 below. Other than titre, they include free fatty acid content (F.F.A.), impurities (moisture and insoluble and unsaponifiable material, abbreviated M.I.U.) and color.

While separate statistics are not available for tallow or grease, it is believed that tallow has comprised over three-fourths of the total output in recent years. Therefore, tallow and grease production is dependent primarily on cattle slaughter and only secondarily on hog slaughter.

Soap Will Continue To Be Largest Domestic Outlet for Tallow

Domestic consumption of inedible tallow and greases in soap has dropped drastically from the postwar peak of 1.5 billion pounds in 1947-48 to 0.7 billion pounds in 1959-60, a drop of over 50 percent (table 18, opposite page). However, the rate of decline has slowed some since the early 1950's.

Table 19.--Characteristics of inedible grades of tallows and greases *

Fat	Titer <u>1/</u> (minimum)	F.F.A. <u>2/</u> (maximum)	M.I.U. <u>3/</u> (basis)	F.A.C. color <u>4/</u> maximum untreated and unbleached
	Degrees Centigrade	Percent	Percent	
Tallow:				
Fancy.....	41.5	4	1	7
Choice.....	41.0	5	1	9
Prime.....	40.5	6	1	13 or 11B
Special.....	40.5	10	1	19 or 11C
No. 1.....	40.5	15	2	33
No. 3.....	40.5	20	2	37
No. 2.....	40.0	35	2	No color
Grease:				
Choice white.	37.0	4	1	11
A, white.....	37.0	8	1	15
B, white.....	36.0	10	2	19 or 11C
Yellow.....	36.0	15	2	37
House.....	37.5	20	2	39
Brown.....	38.0	50	2	No color

1/ Fats with melting point of 40° C. or higher are tallows, while those with melting points less than 40° C. are greases. 2/ Free fatty acid content.

3/ Moisture and insoluble and unsaponifiable material present. 4/ Fat analysis committee of the American Oil Chemists' Society, established color standards.

*Originally issued by the Office of Price Administration.

The sharp drop in tallow used in soap has been offset by expanding use in other products such as fatty acids and animal feeds. Inedible tallow and greases are also used in plastics, nylon, synthetic detergents, and synthetic rubber--often in the form of fatty acids derived from fat-splitting. Nevertheless, soap is still by far the major domestic outlet. In 1959-60, use in soap accounted for 41 percent of the total domestic consumption, use in animal feeds 25 percent, use in fatty acids 22 percent, and all other uses about 12 percent. These consumption trends are expected to continue in 1960-61.

Soap will continue to be the largest consumer of tallow and grease in the U. S., as it has in the past. While some further drop in this market outlet is likely over the next few years, prospects are that usage may level off at around 700 million pounds. Synthetic detergents are expected to continue to displace soap but at a much slower rate than in the past decade. Relatively low tallow prices and large quantities available for tallow-based synthetic detergents are factors which probably will temper the decline in use in soap. Census data in recent years do not show the consumption of fats and oils in synthetic detergents but the quantity is believed to be sizable.

Use of tallow and grease in animal feeds increased from 71 million pounds in 1953-54 (the first year Census data were available) to a peak of 542 million pounds in 1957-58, then fell off to 439 million in 1959-60. These fats are added to livestock and poultry feeds, pet foods and other specialty feeds mainly as a replacement for carbohydrate but also to increase the fat content of the feed and to improve its appearance. The productive energy of tallow is approximately 2.6 times that of ground corn. Relatively low tallow prices were at least partly responsible for the increased use of fats in feeds in recent years. The development of high energy broiler feeds has also been a factor.

The growing practice of adding fats and oils to feed ingredients, particularly oilseed meals and alfalfa meal, may be contributing to the decline in the quantity going directly into formula feeds. The fat content of much of the meal currently being produced is low, since it is produced by solvent processing. Fat added to dehydrated alfalfa meal makes the feed less dusty and easier to handle and also aids in the distribution of the antioxidant that stabilizes the vitamin A content of this meal. Fats added to oilseed meal and alfalfa meal would reduce the need for adding fats to formula feeds since these are important ingredients of most of the prepared feeds.

Tallow and greases consumed in fat-splitting has also shown an upward trend in recent years, rising from 184 million pounds in 1952-53 to a record 390 million in 1959-60. The fatty acids are used by manufacturers of chemicals, rubber, soap, lubricants, paint resins and textiles. This uptrend is expected to continue.

Table 20.--Tallow, inedible and grease: Supply, disposition and price, by months, crop years 1950-59

Year begin- ning October	Apparent production 1/												Year
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.
1950	217	205	222	233	191	196	200	208	171	156	176	165	2,343
1951	183	192	180	213	195	200	192	188	184	176	184	180	2,266
1952	200	195	213	236	204	229	236	233	225	226	198	222	2,616
1953	218	212	251	230	213	238	205	214	209	220	235	218	2,661
1954	224	234	242	249	225	246	238	234	246	227	257	250	2,875
1955	247	272	271	277	280	282	294	281	268	239	257	248	3,215
1956	265	251	292	280	251	285	251	262	266	245	246	254	3,147
1957	261	254	267	252	216	231	229	246	239	229	229	246	2,900
1958	295	236	289	266	234	266	273	266	271	259	254	266	3,198
1959 2/	308	262	300	299	307	307	312	274	279	284	295	296	3,523
1960	304	263											
	Stocks, first of month												
1950	279	249	263	283	315	282	251	250	275	299	340	347	
1951	340	334	339	345	353	346	325	311	315	332	346	338	
1952	340	326	348	375	411	406	398	393	394	392	410	389	
1953	363	313	306	300	307	289	293	282	269	274	289	283	
1954	268	250	248	262	275	263	263	254	250	245	259	259	
1955	260	250	277	299	313	330	343	320	318	331	339	319	
1956	306	308	347	353	360	361	297	263	258	259	262	256	
1957	239	248	258	278	277	254	240	241	236	249	252	241	
1958	230	269	250	296	294	299	297	300	311	317	332	323	
1959 2/	327	333	327	325	325	346	334	323	292	282	301	311	
1960	343	340	331										
	Exports												
1950	66	35	37	28	48	45	56	45	25	33	41	51	509
1951	50	57	57	57	65	84	66	56	49	59	66	52	720
1952	69	59	67	70	77	94	104	100	103	107	103	116	1,070
1953	118	83	120	89	96	88	86	85	103	113	111	93	1,186
1954	105	102	91	101	103	101	113	95	114	112	123	105	1,265
1955	117	106	106	127	123	122	174	135	118	116	128	121	1,494
1956	109	74	145	115	105	189	133	111	122	122	87	118	1,431
1957	84	95	103	89	96	93	83	106	83	95	83	92	1,107
1958	91	111	88	120	85	109	109	106	114	123	119	131	1,311
1959 2/	149	131	160	152	144	158	172	152	121	148	124	106	1,718
1960	146	120											
	Domestic disappearance												
1950	181	156	165	173	176	182	145	138	122	84	130	122	1,777
1951	139	130	117	148	136	138	140	127	118	104	126	126	1,550
1952	145	114	118	130	131	143	138	132	125	100	115	130	1,523
1953	151	135	137	133	135	146	129	122	121	92	131	140	1,574
1954	137	135	137	135	135	145	135	143	139	102	134	144	1,620
1955	141	140	143	135	140	146	144	148	137	115	149	139	1,677
1956	153	138	141	158	145	161	151	156	143	121	166	153	1,786
1957	169	149	144	164	142	152	145	144	143	130	155	165	1,802
1958	164	144	156	148	143	159	161	148	151	119	145	153	1,793
1959 2/	153	137	140	148	141	162	151	154	167	117	161	158	1,790
1960	162	152											
	Price per pound, inedible tallow prime, tanks, Chicago												
1950	12.4	13.5	15.5	17.2	17.8	15.7	14.8	14.7	12.9	9.4	9.0	9.6	13.5
1951	9.1	8.0	7.3	6.6	5.7	5.3	4.7	5.6	6.3	5.7	5.5	5.5	6.3
1952	5.0	4.9	4.7	4.5	3.9	4.4	4.3	3.9	3.6	3.7	3.9	4.5	4.3
1953	4.5	5.6	5.8	6.5	7.4	7.2	6.9	6.8	6.2	5.5	5.9	6.3	6.2
1954	6.7	7.1	7.3	7.8	7.7	6.6	6.7	6.4	6.5	7.1	7.2	7.4	7.0
1955	7.8	7.8	7.5	7.2	6.6	6.6	6.8	6.9	6.3	6.2	6.3	6.7	6.9
1956	6.8	7.0	7.0	6.8	6.8	6.8	6.8	7.0	7.3	7.6	7.8	7.9	7.1
1957	8.0	8.0	7.9	7.6	7.5	7.8	7.4	7.3	7.5	7.6	7.6	7.4	7.6
1958	7.6	7.6	7.2	7.1	6.8	7.0	6.9	6.9	6.6	6.4	6.1	6.2	6.9
1959	6.1	5.9	5.6	5.2	5.3	5.6	5.9	5.7	5.4	5.4	5.6	5.5	5.6
1960	5.5	5.6	5.7										

1/ Computed production based on reported factory consumption, net foreign trade, and change in stocks.
Reported factory production excludes that from small rendering plants.

2/ Preliminary.

Totals computed from unrounded numbers.

The present expectancy for increased utilization of inedible tallow and greases in the U. S. lies in new uses for fatty acids. Soap is on a downtrend which is not expected to turn upward again in the foreseeable future, although synthetic detergents may require some additional amounts of tallow. Animal feeds, lubricants, and most other uses appear to have little growth potential, leaving fatty acids as the main hope for increased domestic consumption of inedible tallow and grease.

More research is needed on the utilization of fatty acids toward the development of products in the synthetic organic chemical field, such as plastics, fibers, rubber, plasticizers, pesticides, lubricating oil additives, lubricants, waxes, solvents, adhesives, and many others. These products constitute a large market for organic raw materials. Inedible tallow at 4 to 5 cents per pound is a potential raw material for making such products and enough research undoubtedly would develop the required technology. Manufacturers of fat chemicals require fairly steady prices if they are to compete effectively with nonfat chemicals such as petroleum and natural gas. An expanding volume of tallow and greases will be available to domestic consumers at fairly steady low prices. These are the prerequisites for its use as a raw material in the synthetic organic chemical field.

Exports: The Most Important Single Market for Inedible Tallow

Heavy exports of U. S. inedible tallow and greases are a relatively new phenomenon, having increased from a mere 74 million pounds in 1947-48 to a record 1,718 million in 1959-60. The U. S. now dominates the world trade in these animal fats accounting for about two thirds of the total world movement.

Although significant quantities of U. S. tallow are exported to a long list of countries, Italy, Japan, and the Netherlands continue to be the major markets; collectively, they received 55 percent of the 1959-60 U. S. shipments (Table 21, opposite page). Belgium-Luxembourg, France, West Germany, Poland, Union of South Africa and Egypt also bought sizable quantities. Australia and New Zealand, the second and third largest exporters, shipped their tallow mainly to the United Kingdom and Japan, with smaller quantities going to the Union of South Africa and the British West Indies.

The spectacular increase in exports has absorbed the large surpluses of tallow and greases which have developed in the postwar era. Increased exports have been stimulated by the effective classification and the low prices of tallow and greases which have been in effect since 1948, except for a period following the outbreak of the Korean war. U. S. tallow is the lowest priced fat or oil in the world today.

Foreign markets for U. S. tallow and greases will play an increasingly important role in the years ahead as the gap between rising production and domestic consumption widens. Prospects are that we will be able to move a rising volume of tallow and greases into export channels. U. S. tallow prices are likely to continue at a relatively low level resulting in a strong competitive position with other fats and oils on the world market. The principal

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Table 21.--Tallow, inedible, and greases: United States exports, by country of destination, 1954-59

Country of destination	Year beginning October					
	1954	1955	1956	1957	1958	1959
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
<u>North America:</u>						
Canada	2/15	24	24	20	18	19
Mexico	39	56	41	60	15	13
El Salvador	5	5	2	1	1	9
Guatemala	3	5	6	8	7	10
Cuba	27	36	30	32	38	25
Dominion Republic	3	3	3	2	6	6
Other	8	14	7	9	15	11
Total	100	143	113	132	100	93
<u>South America:</u>						
Chile	5	8	3/	3/	2	3/
Colombia	17	11	10	15	21	21
Ecuador	8	10	9	8	9	15
Peru	8	11	11	5	7	7
Other	6	8	7	8	10	14
Total	44	48	37	36	49	57
<u>Europe:</u>						
Austria	27	8	6	4	2	1
Belgium-Luxembourg	46	69	49	18	31	53
France	6	4	9	3/	3/	42
Germany, West	98	143	87	32	67	94
Ireland	7	8	1	3/	2	---
Italy	2/210	264	234	267	269	311
Netherlands	2/250	246	232	154	229	266
Norway	4	3	1	1	2	2
Spain	9	27	39	1	2	30
Switzerland	30	23	21	9	8	13
United Kingdom	6	12	12	4	15	26
Poland	2	15	64	39	43	51
Yugoslavia	20	29	25	25	24	12
Other	2/20	18	98	10	12	11
Total	735	869	874	564	706	940
<u>Africa:</u>						
Egypt	39	54	54	63	58	57
Rhodesia and Nyasaland	6	3	3	3/	1	---
Union of South Africa	64	65	48	28	38	64
Other	5	7	5	13	14	24
Total	114	129	111	104	111	145
<u>Asia:</u>						
China, Taiwan	21	26	26	19	27	21
Japan	203	218	229	198	255	352
Korea	15	23	10	15	20	22
Philippines	12	13	13	13	15	18
Other	21	25	14	26	28	70
Total	272	305	292	271	345	483
Total Exports	1,265	1,494	1,431	1,107	1,311	1,718

1/ Preliminary.

2/ Partly estimated.

3/ Less than 500,000 pounds.

Totals computed from unrounded numbers.

competitors of tallow in the world market are palm oil, coconut oil and fish oils. These oils can be used either for soap or for edible purposes. Their prices in the world market are determined mainly by competitive edible oils rather than by competitive soap fats. Therefore, every pound of U. S. tallow used for soap in foreign countries releases a pound of one of these other oils for edible uses. Furthermore, foreign technicians have developed methods for processing and upgrading a portion of the U. S. inedible tallow and grease exports and have been moving it into edible channels in increasing quantities. The process of splitting inedible fats into chemically pure fatty acids and reconstituting into an edible product holds considerable possibilities. Under existing food and drug laws this is not permitted in the United States.

Important factors other than price bearing on the export outlook include the availability of dollars in consuming countries, the rate of growth of synthetic detergents production in consuming countries, and the world political and economic situation as it may affect production and exports of fats and oils.

Steady Low Price Level of Tallow and Greases in the Offing

A new era in tallow and grease economics has emerged in the postwar period as a result of the development of synthetic detergents along with steadily increasing output of tallow and greases. In earlier years of the tallow industry, prices varied widely because the supply was limited and soap was in great demand. Today we do not have to use soap because of the availability of synthetic detergents and there is now plenty of tallow.

Excluding 1950-51, prices of inedible tallow (prime, tanks, Chicago) fell steadily from an average of 18.5 cents per pound in 1947-48 to 4.3 cents in 1952-53. Wide variations of this magnitude have been an historical characteristic of tallow as well as other fats and oils. Prices after 1952-53 moved up to 7.6 cents per pound in 1957-58 but since then have drifted lower to an average of 5.6 cents per pound in 1959-60. Prices of inedible tallow during the current marketing year are expected to continue at about the same low level as last year.

Tallow and grease production is expected to continue to expand and the surplus above domestic consumption will become even larger. The only outlet in view at this time is the export market, and prices will have to continue low if the export market is to absorb the surpluses. Therefore, the outlook is for a steady low price level of tallow and greases for some time to come. However, the price differential between inedible tallow and competitive edible-inedible fats and oils probably will narrow in the world markets.

Analysis of the various factors affecting the production and consumption of tallow and grease in the U. S. indicate that the quantity of these fats available for export probably will continue to grow during the 1960's. Based on projected livestock slaughter and meat production, inedible tallow and grease output should increase from the 3.6 billion pounds forecast for

1960-61 to about 4.2 billion pounds in the mid-60's. With little change likely in domestic consumption during this period, this would leave an indicated surplus of about 2.4 billion pounds available for export.

Since domestic disappearance is expected to remain fairly stable during the next few years, the two major factors in the tallow and grease outlook are production and exports. As output tends to go up (almost irrespective of price), export demand becomes the most elastic and dominant factor. This means that export demand rather than domestic demand will continue to largely determine the price of tallow and greases in this country.

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